

CUBIT Capability Proposal

Technical Area

Geometry, Meshing, Infrastructure, GUI, Graphics, etc..

Technical Lead

Cubit Developer in charge of technical area

Mesh Optimization	Michael Brewer
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MRD Description

Describe the capability in terms of how a user would see it.

A faster mesh untangler.

SRS Description

What needs to be done by Cubit developers to implement this capability? Break the tasks into steps if applicable. (Steps should be on the order of 2 man-weeks or more)

1) Re-write the untangler to significantly improve speed.

Justification

Describe why this is important and what impact it will have if it is implemented. (or not implemented).

Typically, tangled meshes have a small number of inverted elements relative to the number of valid elements. By taking advantage of this behavior, I feel we could speed up the current untangling algorithms by possibly an order of magnitude. This is because, I believe, there are a lot of unnecessary flops being performed for the already valid elements. This can be done either by simply re-writing the current (global) algorithm or by writing a local-optimization scheme with node culling. Both the local and the global have their weakness, and so an alternative would be to write a local-optimization scheme and revert to the current global scheme if the local scheme failed. These changes should probably be incorporated into Mesquite instead of Cubit.

Resources

Who will work on this

Time estimate

How much time will it take in man-weeks

Targeted Release

10.2 (August 06), 10.3 (March 2007), 10.4 (August 2007), Future (beyond FY07)

Michael Brewer	4	10.2
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Submitted By:

Michael Brewer	3-30-2006
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